

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps of:

defining a correspondence between an original set of audio data and an original set of video data such that the original set of audio data and the original set of video data are

synchronized at a normal display rate;

determining a target display rate that differs from the normal display rate;

creating a modified set of audio data that corresponds to the original set of audio data, wherein the modified set of audio data is created based at least in part on the target display rate;

establishing a correspondence between the modified set of audio data and the original set of video data; and

creating a modified set of video data that corresponds to the original set of video data, based on the modified set of audio data and the correspondence between the modified set of audio data and the original set of video data, such that the modified set of video data is synchronized with the modified set of audio data.

2. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein the step of defining a correspondence between the original set of audio data and the original set of video data comprises the steps of:

dividing the original set of video data into a plurality of subunits, each representing a substantially equal duration of time;

dividing the original set of audio data into a plurality of segments, each segment representing a duration of time that is approximately coincident with and substantially equal to the duration of time of a corresponding subunit of the original set of video data; and

identifying corresponding subunits of the original set of video data and segments of the original set of audio data.

3. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein establishing a correspondence between the modified set of audio data and the original set of video data is based upon the correspondence between the modified set of audio data and the original set of audio data and the correspondence between the original set of audio data and the original set of video data.

4. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein the step of creating a modified set of video data comprises the steps of:

identifying one or more partial or complete subunits of the original set of video data that correspond to audio segments of the modified set of audio data, based upon the correspondence between the modified set of audio data and the original set of video data; and

modifying the subunits of the original set of video data as necessary to produce the modified set of video data so that there is a one-to-one correspondence between audio segments of the modified set of audio data and subunits of the modified set of video data.

5. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein the step of creating a modified set of video data comprises the steps of:

grouping the modified set of audio data into audio segments;

identifying one or more partial or complete subunits of the original set of video data that correspond to each of the audio segments of the modified set of audio data, based upon the correspondence between the modified set of audio data and the original set of video data; and

modifying the subunits of the original set of video data as necessary to produce the modified set of video data so that there is a one-to-one correspondence between audio segments of the modified set of audio data and subunits of the modified set of video data.

6. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein the step of creating a modified set of video data comprises the steps of:

grouping the modified set of audio data into audio segments, each segment representing a duration of time that is approximately coincident with and substantially equal to the duration of time of a subunit of video data;

identifying one or more partial or complete subunits of the original set of video data that correspond to each of the audio segments of the modified set of audio data, based upon the correspondence between the modified set of audio data and the original set of video data; and

modifying the subunits of the original set of video data as necessary to produce the modified set of video data so that there is a one-to-one correspondence between audio segments of the modified set of audio data and subunits of the modified set of video data.

7. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1 wherein the step of creating a modified set of video data comprises the steps of:

grouping the modified set of audio data into audio segments, each segment representing a duration of time that is approximately coincident with and substantially equal to the duration of time of a frame of video data;

identifying one or more partial or complete frames of the original set of video data that correspond to each of the audio segments of the modified set of audio data, based upon the correspondence between the modified set of audio data and the original set of video data; and

modifying the frames of the original set of video data as necessary to produce the modified set of video data so that there is a one-to-one correspondence between audio segments of the modified set of audio data and frames of the modified set of video data.

8. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1, wherein the step of creating a modified set of video data includes the step of eliminating data from the original set of video data.

9. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1, wherein

the step of creating a modified set of video data includes the step of adding data to the original set of video data.

10. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1, wherein the step of creating a modified set of video data includes the step of blending data from the original set of video data so that the modified set of video data has less data than the original set of video data.

11. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1, wherein the step of creating a modified set of video data includes the step of synthesizing data, based on the data in the original set of video data, so that the modified set of video data has more data than the original set of video data.

12. (Original) A method of synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising the steps recited in Claim 1, further comprising the steps of:

generating an audio display from the modified set of audio data; and
generating a video display from the modified set of video data.

13. (Currently Amended) A computer-readable medium carrying storing instructions for a method for synchronizing a set of video data to a set of audio data that is being played at a variable rate, the method comprising:

defining a correspondence between an original set of audio data and an original set of video data such that the original set of audio data and the original set of video data are synchronized at a normal display rate;

determining a target display rate that differs from the normal display rate;

creating a modified set of audio data that corresponds to the original set of audio data, wherein the modified set of audio data is created based at least in part on the target display rate;

establishing a correspondence between the modified set of audio data and the original set of video data;

creating a modified set of video data that corresponds to the original set of video data, based on the modified set of audio data and the correspondence between the modified set of audio data and the original set of video data, such that the modified set of video data is synchronized with the modified set of audio data; and

outputting for display on a computing or display device the modified set of video data.

14. (Currently Amended) A system for synchronizing a set of video data to a set of audio data that is being played at a variable rate comprising a processor configured to:

define a correspondence between an original set of audio data and an original set of video data such that the original set of audio data and the original set of video data are synchronized at a normal display rate;

determine a target display rate that differs from the normal display rate;

create a modified set of audio data that corresponds to the original set of audio data, wherein the modified set of audio data is created based at least in part on the target display rate;

establish a correspondence between the modified set of audio data and the original set of video data; and

create a modified set of video data that corresponds to the original set of video data, based on the modified set of audio data and the correspondence between the modified set of audio data and the original set of video data, such that the modified set of video data is synchronized with the modified set of audio data.

15. (New) The computer-readable medium of claim 13, wherein creating a modified set of audio data comprises:

dividing the original set of audio data into multiple audio segments;

determining a target overlap between segments based on the target display rate;

and

generating one or more new audio segments based on the multiple audio segments and the target overlap.

16. (New) The computer-readable medium of claim 13, wherein creating a modified set of audio data comprises:

dividing the original set of audio data into multiple audio segments;

evaluating multiple possible overlaps between adjacent segments of the multiple audio segments;

selecting a best overlap from the multiple possible overlaps according to a quality metric; and

generating a new audio segment based on the selected best overlap.

17. (New) The computer-readable medium of claim 13, wherein determining a target display rate comprises:

analyzing the original set of audio data to determine audio characteristics; and

selecting the target display rate based on the determined audio characteristics.

18. (New) The computer-readable medium of claim 13, wherein determining a target display rate comprises:

analyzing the original set of audio data to detect voices; and

selecting the target display rate based on characteristics of the detected voices.

19. (New) The computer-readable medium of claim 13, wherein the original set of video data comprises multiple video frames and wherein creating a modified set of video data comprises generating one or more new video frames based on data from adjacent video frames of the multiple video frames.

20. (New) The computer-readable medium of claim 13, wherein the original set of video data comprises multiple video frames, each video frame having multiple pixels, and wherein determining a target display rate comprises:

detecting a rate of change of one or more pixels of the multiple video frames;

selecting the target display rate based on the rate of change.